DIFFICULT PRIMARY TKR: THE STIFF KNEE

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THE STIFF KNEE

DEFINITION

A KNEE WITH LESS THAN A 50° ARC OF MOVEMENT

Aglietti 1989

THE STIFF KNEE

ETIOLOGY

- PRIMARY/IDIOPATHIC
- SECONDARY
  - TO CONGENITAL PATHOLOGIES
  - TO ACQUIRED PATHOLOGIES
  - TO TRAUMA
  - TO ARTIFICIAL KNEE Implants
  - TO ACQUIRED PATHOLOGIES

THE MOST IMPORTANT FACTOR PREDICTING POSTOPERATIVE ROM WAS PREOPERATIVE ROM

Hsu 2012

COMPLICATIONS FOR TKA IN PATIENTS WITH STIFF KNEES

-NECROSIS 6%: NEED FOR SPECIAL CARE IN HANDLING SKIN FLAPS, SOMETIMES A MUSCLE FLAP OR A SKIN GRAFT REQUIRED BEFORE TKA

SKIN NECROSIS 5%: NEED FOR SPECIAL CARE IN HANDLING SKIN FLAPS, SOMETIMES A MUSCLE FLAP OR A SKIN GRAFT REQUIRED BEFORE TKA

Kioko et al, CORR 2009

SYSTEMATIC REVIEW

COMPLICATION RATE 14%

Kim 2009

Hsu 2012
**THE STIFF KNEE**

**ETIOLOGICAL CLASSIFICATION**
- Degenerative
  - Mostly soft tissue deformity
- Post-traumatic
  - Mostly bone deformity

**FUNCTIONAL CLASSIFICATION**
- Flexion stiffness (flexion deficit)
  - or
  - Flexion contracture (extension deficit)

**FLEXION STIFFNESS**

**DEFINITION**
Inability to achieve full passive flexion

Not common as flexion contracture before TKA

**FLEXION STIFFNESS IN KNEE OA IS USUALLY PRODUCED BY**
- Quadriceps contracture
- Heterotopic ossification
- Patella baja
- Soft-tissue adhesions
- Combined

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**FLEXION STIFFNESS**

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**OUR CHOICE**

**TECHNICAL OPTIONS TO ACHIEVE FLEXION**
- Quadriceps "snip"
- Quadriceps V-Y plasty
- Osteotomy of the tibial tubercle

**TECHNICAL KEY-POINTS**

The tibial tuberosity should be osteotomized to protect the patellar tendon in case of severe stiffness

The V-Y quadricepsplasty was associated with a greater post-operative extension lag and inferior clinical outcome

**REFERENCES**

Bradley, 1987
Mullen, 1983
Tew, 1987
Cloutier, 1999
Rajgado 2005
Sculco, 2001
Massin, 2009
Hsu, 2012
OUTCOMES

OUTCOMES FOR TKA AFTER PREVIOUS FRACTURE ARE INFERIOR TO THOSE FOLLOWING PRIMARY TKA FOR OA

COMPLICATION REPORTED IN 57% CASES

Bedi 2009

CLINICAL CASE

CLINICAL CASES

FLEXION CONTRACTURE

DEFINITION

INABILITY TO ACHIEVE FULL PASSIVE EXTENSION

FLEXION CONTRACTURE IS A COMMON DEFORMITY BEFORE TKA 61% OF TKAs

Tew 1987
Cloutier 1999

FLEXION CONTRACTURE IN KNEE OA IS USUALLY PRODUCED BY

• BONE IMPINGEMENT
• SOFT TISSUE SHORTENING
• COMBINED

ORIGIN OF FLEXION CONTRACTURE IN OA KNEE

• POSTERIOR FEMORAL OSTEOPHYTES
• ANTERIOR TIBIAL OSTEOPHYTES
• NOTCH OSTEOPHYTES
• PCL RETRACTION
• POSTERIOR CAPSULE RETRACTION
• COLLATERAL LIGAMENTS RETRACTION
• HAMSTRINGS RETRACTION
• GASTROCNEMIUS RETRACTION
• BICEPS FEMORIS RETRACTION
**FLEXION CONTRACTURE**

TREATMENT DEPENDS ON SEVERITY OF CONTRACTURE

**CLASSIFICATION OF FLEXION CONTRACTURE**

- **MILD**
  - 5° - 15°
- **MODERATE**
  - 15° - 30°
- **SEVERE**
  - > 30°

Bellemans, 2006
Font-rodriguez, 1997
Robertson, 2000
Roberts, 2007

**TREATMENT**

**MILD CONTRACTURE (<15°)**
- STANDARD BONE RESECTION
- MEDIOLATERAL BALANCING
- OSTEOPTYES REMOVAL
- ADDITIONAL DISTAL FEMUR RESECTION (+ 2mm)

IT IS MANDATORY TO OBTAIN INTRA-OP
- FLEX-EXT GAPS EQUAL AND SIMMETRICAL
- FULL EXTENSION

RESIDUAL FLEXION CONTRACTURE WILL NOT IMPROVE OVERTIME!

Laske, 2004
Scuderi, 2004

**TREATMENT**

**MODERATE CONTRACTURE (15° - 30°)**
- ADDITIONAL POSTERIOR CAPSULE RELEASE IS NECESSARY
  - COMPLETE PCL RELEASE
  - SUBPERIOSTEAL ELEVATION FROM POSTERIOR FEMORAL CONDYLES (1-2 cm)

IF FLEX-EXT GAPS MISMATCH IS PRESENT
ADDITIONAL DISTAL FEMUR RESECTION UP TO A MAXIMUM OF 4 mm

**TREATMENT**

**SEVERE FLEXION CONTRACTURE (>30°)**
- SUBPERIOSTEAL RELEASE OF MEDIAL AND/OR LATERAL GASTROCNEMIUS HEAD OFF POSTERIOR FEMUR
- CAREFUL TRANSVERSE SECTIONING OF POSTERIOR CAPSULE
- RISK OF POPLITEAL ARTERY AND VEIN DAMAGE
- BICEPS TENOTOMY (RISK PERONEAL NERVE PALSY)

Bellemans, 2006
Omeroglu, 2001
Schinsky, 2001
Insall, 1979
Laske, 1989

**JOINT RECONSTRUCTION**

**IMPLANT CHOICE**
- AVOID PCR PROSTHESIS
- BE PREPARED TO USE DIFFERENT TYPE OF PROSTHESSES
- ACHIEVE A STABLE KNEE WITH THE LEAST AMOUNT OF IMPLANT CONSTRAIN
PRE-OP FLEXION CONTRACTURE AFFECTS POSTOPERATIVE OUTCOME

PAIN SCORES, FUNCTION SCORES AND KSS ARE REDUCED RESPECT TO KNEES WITH NORMAL EXTENSION

THE GREATER THE DEFORMITY

THE HIGHER THE RISK OF POSTOPERATIVE RESIDUAL DEFORMITY

Lam 2003
Ritter 2007

TO PREVENT DEFORMITY RECURRENCE

ESSENTIAL TO ACHIEVE FULL EXTENSION DURING EARLY REHABILITATION

MOST FLEXION CONTRACTURE STRETCH OUT WITH TIME AND IMPROVE UP TO 3 YEARS AFTER TKA

EXTENSION BRACE OR PLASTIC CAST MAY BE USED

IF RECURRENT DEFORMITY IS OBSERVED

McPherson 1999
Aderito 2005

CONCLUSION

STIFF KNEE

✓ COMBINED WITH OTHER DEFORMITIES
✓ DEALT WITH SEQUENTIAL SURGICAL STEPS
✓ FULL CORRECTION AT INITIAL TKA
✓ CUSTOMIZED PHYSICAL THERAPY
✓ FREQUENT F.U. CONTROL

KEEP IN MIND:
RESIDUAL CONTRACTURE = POOR FUNCTIONAL OUTCOME

ISTITUTO ORTOPEDICO RIZZOLI
III CLINICA ORTOPEDICA

THANK YOU